

SUBJECT: Geometry		GRADE: 9-12	
Unit 1: Basics of Geometry		Time Frame: 3 Weeks	
UNIT OVERVIEW			
In this unit, we will learn about: • Patterns and Inductive Reasoning • Points, Lines and Planes • Segments and their Measures • Angles and their Measures • Segment and Angle Bisectors • Angle Pair Relationships • Introduction to Perimeter, Circumference, and Area			
LRG SKILLS AND DISPOSITIONS		PA STANDARDS	
		CC.2.3.HS.A.3 CC.2.3.HS.A.14	
COMPETENCIES		LEARNING TARGETS	
Sequences and Series I can identify, describe, and represent various types of sequences and series.		• I can write a rule for the nth term of a sequence. (K1MAB14O1)	
Logic and Reasoning I can identify, state, and construct valid arguments to prove statements with mathematical logic and reasoning.		• I can determine if a logic statement is true or false and use a counterexample, if necessary. (K1MAB8O10)	
Geometry I can describe, analyze, and apply geometric relationships to solve problems.		• I can construct and interpret diagrams involving points, lines, segments, rays, and planes. (K1MAB9O1)	

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| | <ul style="list-style-type: none">● I can calculate lengths of segments using properties of midpoints, distance formula, Pythagorean theorem, and/or the segment addition postulate. (K1MAB9O2)● I can differentiate between and calculate measurements of angles using properties of angle bisectors, adjacent angles, linear pairs, vertical angles, complementary angles, supplementary angles, and/or the angle addition postulate. (K1MAB9O3)● I can apply my knowledge of perimeter, circumference, and area of rectangles, triangles, and circles to solve real-world problems. (K1MAB9O4) |
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SUBJECT: Geometry		GRADE: 9-12	
Unit 2: Reasoning and Proof		Time Frame: 3 Weeks	
UNIT OVERVIEW			
In this unit, we will learn about: - Conditional Statements: Converses, Inverses and Contrapositives - Definitions and Biconditional Statements - Deductive Reasoning - Reasoning with Properties from Algebra - Proving Statements about Segments - Proving Statements about Angles			
LRG SKILLS AND DISPOSITIONS		PA STANDARDS	
- Critical Thinking & Problem Solving: Law of Syllogism Project (S4C) - Critical Thinking & Problem Solving: Proofs (S4C) - Creativity & Innovation: Law of Syllogism Project (S3C)		CC.2.3.HS.A.3	
COMPETENCIES		LEARNING TARGETS	
Logic and Reasoning I can identify, state, and construct valid arguments to prove statements with mathematical logic and reasoning.		- I can distinguish between the hypothesis and conclusion of conditional statements. (K1MAB8O1) - I can identify and rewrite conditional statements in different forms (inverse, converse, contrapositive, and biconditional). (K1MAB8O2) - I can infer which point, line, and plane postulate a diagram or statement is representing. (K1MAB8O3) - I can recognize and use the properties of algebra to justify a logical argument. (K1MAB8O4)	

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| | <ul style="list-style-type: none">• I can prove statements involving algebra, segments, and angles with theorems, postulates, definitions, and algebraic properties.
(K1MAB8O5) |
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SUBJECT: Geometry		GRADE: 9-12	
Unit 3: Perpendicular and Parallel Lines		Time Frame: 4 Weeks	
UNIT OVERVIEW			
In this unit, we will learn about: • Lines and Angles • Proofs and Perpendicular Lines • Parallel Lines and Transversals • Proving Lines are Parallel • Using Properties of Parallel Lines • Parallel and Perpendicular Lines in a Coordinate Plane			
LRG SKILLS AND DISPOSITIONS		PA STANDARDS	
• Critical Thinking & Problem Solving: Proofs (S4C)		CC.2.3.HS.A.3 CC.2.3.HS.A.11 CC.2.3.HS.A.14	
COMPETENCIES		LEARNING TARGETS	
Geometry I can describe, analyze, and apply geometric relationships to solve problems.		• I can differentiate between parallel lines, perpendicular lines, and skew lines. (K1MAB9O5) • I can differentiate between and calculate with special angle pairs (corresponding angles, consecutive interior angles, alternate interior angles, alternate exterior angles). (K1MAB9O6) • I can apply concepts from algebra regarding graphing, linear equations, and slope to prove lines are parallel, perpendicular, or neither. (K1MAB9O7)	

Logic and Reasoning

I can identify, state, and construct valid arguments to prove statements with mathematical logic and reasoning.

- I can prove statements by using special angle pair properties, postulates, and theorems. (K1MAB8O6)
- I can prove statements involving parallel and perpendicular lines with properties, theorems, and postulates. (K1MAB8O7)

SUBJECT: Geometry		GRADE: 9-12	
Unit 4: Congruent Triangles		Time Frame: 4 Weeks	
UNIT OVERVIEW			
In this unit, we will learn about: • Triangles and Angles • Congruence and Triangles • Proving Triangles are Congruent (SSS, SAS, ASA, AAS, HL) • Using Congruent Triangles • Isosceles, Equilateral, and Right Triangles			
LRG SKILLS AND DISPOSITIONS		PA STANDARDS	
• Critical Thinking & Problem Solving: Proofs (S4C)		CC.2.3.HS.A.3 CC.2.3.HS.A.14	
COMPETENCIES		LEARNING TARGETS	
Geometry I can describe, analyze, and apply geometric relationships to solve problems.		• I can classify triangles by angles and sides. (K1MAB9O8) • I can distinguish between the triangle congruence shortcuts (SSS, SAS, AAS, ASA, and HL). (K1MAB9O9) • I can use the triangle congruence shortcuts to conclude that triangles are congruent. (K1MAB9O10) • I can apply the triangle congruence shortcuts, postulates, and theorems to write algebraic equations and solve application problems. (K1MAB9O11)	
Logic and Reasoning I can identify, state, and construct valid arguments to prove statements with mathematical logic and reasoning.		• I can write proofs using triangle congruence theorems and postulates. (K1MAB8O8)	

SUBJECT: Geometry		GRADE: 9-12	
Unit 5: Properties of Triangles		Time Frame: 3 Weeks	
UNIT OVERVIEW			
In this unit, we will learn about: • Perpendicular and Bisectors • Bisectors of a Triangles • Medians and Altitudes of a Triangle • Midsegment Theorem • Inequalities in One Triangle			
LRG SKILLS AND DISPOSITIONS		PA STANDARDS	
• Honesty, Integrity and Responsibility 9-12: Student conference regarding assignments (D3C) • Resilience and Grit 9-12: Student conference regarding taking advantage of opportunities for improvement (D4C) • Collaboration and Teamwork 9-12: Student conference regarding collaboration (S1C)		CC.2.3.HS.A.3 CC.2.3.HS.A.11 CC.2.3.HS.A.14	
COMPETENCIES		LEARNING TARGETS	
Geometry I can describe, analyze, and apply geometric relationships to solve problems.		• I can solve problems with perpendicular and angle bisectors. (K1MAB9O12) • I can differentiate between the circumcenter, incenter, centroid, and orthocenter of a triangle and their identifying segments. (K1MAB9O13) • I can solve problems using the properties of the circumcenter, incenter, centroid, and orthocenter of a triangle. (K1MAB9O14)	

	• I can solve problems using the midsegment of a triangle. (K1MAB9O15) • I can use my knowledge of inequalities to use the Third Side Theorem and/or the Converse to the Pythagorean Theorem in triangles. (K1MAB9O16)
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SUBJECT: Geometry		GRADE: 9-12	
Unit 6: Quadrilaterals		Time Frame: 4 Weeks	
UNIT OVERVIEW			
In this unit, we will learn about: • Polygons • Properties of Parallelograms and Using Parallelograms to Prove Statements • Proving Quadrilaterals and Parallelograms • Special Parallelograms: Rhombuses, Rectangles and Squares • Trapezoids and Kites • Special Quadrilaterals and their Properties • Quadrilateral Areas			
LRG SKILLS AND DISPOSITIONS		PA STANDARDS	
• Critical Thinking & Problem Solving: Proofs (S4C)		CC.2.3.HS.A.3 CC.2.3.HS.A.14	
COMPETENCIES		LEARNING TARGETS	
Geometry I can describe, analyze, and apply geometric relationships to solve problems.		• I can classify polygons using polygon names, concave, convex, equiangular, equilateral, and regular. (K1MAB9O17)	

	• I can apply the quadrilateral properties, postulates, and theorems for parallelograms, rectangles, rhombi, squares, kites, trapezoids, and isosceles trapezoids. (K1MAB9O18) • I can calculate the area of quadrilaterals. (K1MAB9O19) • I can apply my knowledge of the area of quadrilaterals to real-world problems. (K1MAB9O20)
Logic and Reasoning I can identify, state, and construct valid arguments to prove statements with mathematical logic and reasoning.	• I can prove statements involving quadrilaterals. (K1MAB8O9)

SUBJECT: Geometry		GRADE: 9-12	
Unit 12: Surface Area and Volume		Time Frame: 3 Weeks	
UNIT OVERVIEW			
In this unit, we will learn about: ● Exploring Solids and Polyhedrons: Vocabulary and Euler’s Theorem ● Surface Area of Prisms, Cylinders, Pyramids, Cones and Spheres ● Volume of Prisms, Cylinders, Pyramids, Cones and Spheres ● Surface Area and Volume of Composite Solids			
LRG SKILLS AND DISPOSITIONS		PA STANDARDS	
● Creativity & Innovation: Build a Polyhedron (SC3)		CC.2.3.HS.A.3 CC.2.3.HS.A.12 CC.2.3.HS.A.13 CC.2.3.HS.A.14	
COMPETENCIES		LEARNING TARGETS	

Geometry I can describe, analyze, and apply geometric relationships to solve problems.	• I can classify solids using the terminology concave, convex, faces, edges, vertices, cross-sections, prisms, cones, pyramids, cylinders, and spheres. (K1MAB9O21) • I can use the properties of solids and Euler's theorem to solve problems. (K1MAB9O22) • I can calculate the surface area of 3D solids. (K1MAB9O23) • I can calculate the volume of 3D solids. (K1MAB9O24) • I can calculate the surface area and volume of composite solids. (K1MAB9O25)
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SUBJECT: Geometry GRADE: 9-12	
Unit 8: Similarity	Time Frame: 3 Weeks
UNIT OVERVIEW	
In this unit, we will learn about: • Ratios and Proportions • Problem Solving in Geometry with Proportions • Similar Polygons • Similar Triangles • Using Similarity Theorems and Proving Triangles are Similar • Proportions and Similar Triangles • Similar Solids	
LRG SKILLS AND DISPOSITIONS	PA STANDARDS
	CC.2.3.HS.A.3 CC.2.3.HS.A.6 CC.2.3.HS.A.13 CC.2.3.HS.A.14

COMPETENCIES	LEARNING TARGETS
Ratios and Proportions I can recognize, represent, and utilize ratios and proportional relationships to solve problems.	- I can apply my knowledge of ratios and proportions from Algebra to similar figures and geometric mean. (K1MAB3O1) - I can use scale factor, perimeter ratio, and area ratio to find the perimeter and area of similar polygons & the surface area and volume of similar solids. (K1MAB3O2)
Geometry I can describe, analyze, and apply geometric relationships to solve problems.	- I can use the properties of similar triangles to solve real-world problems (indirect measurement). (K1MAB9O26) - I can distinguish between similarity properties, similarity theorems, and congruence and/or apply them. (K1MAB9O27)

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Unit 9: Right Triangles and Trigonometry	Time Frame: 3 Weeks
UNIT OVERVIEW	
In this unit, we will learn about: - Similar Right Triangles - The Pythagorean Theorem - Converse to the Pythagorean Theorem & Pythagorean Inequalities - Special Right Triangles - Trigonometric Ratios and Inverse Trig Ratios - Angle of Elevation and Depression Applications - Solving Right Triangles	
LRG SKILLS AND DISPOSITIONS	PA STANDARDS
	CC.2.2.HS.C.9

	CC.2.3.HS.A.3 CC.2.3.HS.A.7 CC.2.3.HS.A.14
COMPETENCIES	LEARNING TARGETS
Ratios and Proportions I can recognize, represent, and utilize ratios and proportional relationships to solve problems.	I can use properties and proportions of special right triangles (30-60-90 and 45-45-90) to solve problems with missing angles and sides. (K1MAB3O3)
Geometry I can describe, analyze, and apply geometric relationships to solve problems.	- I can use my knowledge of inequalities to use the Third Side Theorem and/or the Converse to the Pythagorean Theorem in triangles. (K1MAB9O16) - I can solve for lengths of similar right triangles using geometric means. (Heartbeat and Boomerang) (K1MAB9O28) - I can determine which trigonometric ratio can be used to solve for missing sides or angles in a right triangle and use it appropriately. (K1MAB9O29) - I can apply my knowledge of trigonometric ratios and Pythagorean theorem to solve real world problems (angle of elevation/depression). (K1MAB9O30)

SUBJECT: Geometry GRADE: 9-12	
Unit 10: Circles	Time Frame: 3 Weeks
UNIT OVERVIEW	
In this unit, we will learn about: - Tangents to Circles - Arcs and Chords - Inscribed Angles and Polygons	

• Other Angle Relationships in Circles • Segment Lengths in Circles	
LRG SKILLS AND DISPOSITIONS	PA STANDARDS
	CC.2.3.HS.A.3 CC.2.3.HS.A.8 CC.2.3.HS.A.14
COMPETENCIES	LEARNING TARGETS
Geometry I can describe, analyze, and apply geometric relationships to solve problems.	• I can distinguish between circle terms and identify them in diagrams. (K1MAB9O31) • I can determine angle relationships in circles and solve for missing measures. (K1MAB9O32) • I can determine segment relationships in circles and solve for missing lengths. (K1MAB9O33)

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Unit 11: Area of Polygons and Circles	Time Frame: 2 Weeks
UNIT OVERVIEW	
In this unit, we will learn about: • Circumference and Arc Length • Areas of Circles and Sectors • Angle Measures in Polygons - Interior and Exterior • Areas of Regular Polygons • Perimeter and Areas of Similar Figures	
LRG SKILLS AND DISPOSITIONS	PA STANDARDS

	CC.2.3.HS.A.3 CC.2.3.HS.A.9 CC.2.3.HS.A.14
COMPETENCIES	LEARNING TARGETS
Geometry I can describe, analyze, and apply geometric relationships to solve problems.	• I can apply my knowledge of circumference of circles to calculate arc length. (K1MAB9O34) • I can apply my knowledge of area of circles to calculate sector area. (K1MAB9O35) • I can calculate angle measures in polygons (interior and exterior). (K1MAB9O36) • I can apply my knowledge of angle measures, Pythagorean theorem, and trigonometric functions to find the area/perimeter of regular polygons. (K1MAB9O37)